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The purpose of this paper is to review recent Soviet research on the child's development of Russian grammar, with detailed information on valuable methods for investigating this process. Cross-linguistic comparisons are made where applicable in view of their relevance for the study of universal aspects of language acquisition and linguistic competence. Specific aspects of linguistic ontogenesis are discussed: (1) the structure of two-word sentences; (2) word order; (3) inflections and word classes; and (4) comprehension. A brief history of developmental psycholinguistics in the USSR is included. Listed are diaries and observational studies of monolingual and bilingual children, and a bibliography which includes these and general background materials. (KL)

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EARLY GRAMMATICAL DEVELOPMENT IN SEVERAL LANGUAGES WITH SPECIAL ATTENTION TO SOVIET RESEARCH

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> It is frightening to think what an enormous number of grammatical forms are poured over the poor head of the young child. And he, as if it were nothing at all, adjusts to all this chaos, constantly sorting out into rubrics the disorderly elements of the words he hears, without noticing as he does this, his gigantic effort. If an adult had to master so many grammatical rules within so short a time, his head would surely burst--a mass of rules mastered so lightly and so freely by the two-year-old "linguist". The labor he thus performs at this age is astonishing enough but even more amazing and unparalleled is the ease with which he does it.
>
> In truth, the young child is the hardest mental toiler on our planet. Fortunately, he does not even suspect this.
>
> --Korney Chukovskiy (1963:10)

Psychologists, linguists, and philosophers have recently come to devote serious attention to the American child's mastery of English grammar. The preceding papers in this section reflect the growing strength of theoretical and empirical interest in this area, and point to implications for language acquisition in general, regardless of the specific native language being acquired. Developmental psycholinguistics is also extremely active in the Soviet Union, providing important data on the acquisition of Russian as a native language (Slobin, 1966a, b, c). Both American and Soviet investigations have their roots in over a century of European and American diary studies, going back at least to Darwin's observations of his son's development, and covering more than a dozen languages. Parental diaries of child language development are flawed by methodological shortocming and paucity of data, and have therefore been largely ignored in current American developmental psycholinguistics. With the exception of recent careful Soviet research, however, they provide the only body of

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data presently available for cross-linguistic study of the determinants of child language development. In spite of their shortcomings, diaries in other languages can raise new questions and cast light on old ones.

The primary emphasis of this paper is on the child's development of Russian grammar, with detailed information on valuable Soviet methods of investigating this process. When applicable, comparisons are made to child language in Bulgarian, Polish, English, German, Dutch, French, Romainian, Hungarian, Japanese, Georgian, and Garo. The most extensive data available are on Indo-European languages, but within this group Russian is sufficiently different from English--most clearly in its highly inflectional grammatical structure--to serve as a useful contrast case to sharpen notions of universal aspects of language acquisition and linguistics competence.

A list of diaries and observational studies cited in the literature is given in Table 1. Those referred to in preparing this paper are marked with an asterisk; the others were unavailable either because of language barrier or physical inaccessibility. In presenting the list it is hoped that others will find these works and make use of them for comparative analysis.

Table 1

Diaries and Observational Studies of the Acquisition of Various Languages as Native Tongues

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Monolingual Children

Bulgarian: Cheorgov (1905, 1906, 1908*)

Chinese: Chao (1951)

Czech: Cada (1906-8)

Danish: Forchhammer (1939), Jespersen (1916), Rasmussen (1913, 1922)

Dutch: Ginneken (1917), Kaper (1959*)

English: Bateman (1914, 1915, 1916), Bohn (1914), Boyd (1913, 1926-7), Braine (1963*), Brown and Bellugi (1964*), Brown and Fraser (1963*), Chamberlain and Chamberlain (1904, 1905), Darwin (1877)

Ervin (1964*), Lewis (1936*, 1937), Major (1906), Miller (1964*) Miller and Ervin (1964*), Moore (1895-6), Nice (1917, 1925, 1933) Snyder (1914*), Sully (1896), Taine (1877), Velten(1943*).

Estonian: Saareste (1936)

French: Bloch (1913, 1921*, 1924*), Cohen (1925, 1933*), Deville (1890, 1891), Gregoire (1937, 1947), Guillaume (1927a*, 1927b*), Roussey 1899-1900)

Georgian: Avalishvili (1950).

German: Ament (1899*), Bergmann (1919), Friedrich (1906), Idelberger (1903), Krotzsch (1910), Linder (1882, 1885, 1898*), Neugebauer (1915*), Preyer (1912), Schadel (1905), Scupin (1907*), Stern and Stern (1907*), Stumpf (1901*), Tappolet (1907*), Tiedemann (1787), Togel (1905).

Hungarian: Balassa (1893), Endrei (1913), Kenyeres (1926, 1927*), Simonyi (1906).

Icelandic: Forchhammer (1939), Saeunnar-mal (1891).

Italian: Lombroso (1894)

Japanese: Kido (1931), Kubo (1922), Matumoto (1932), McNeill (1966a), McNeill and McNeill (1966), Ohwaki (1928, 1933*).

Polish: Kaczmarek (1953*), Kaus (1897), Oltuszewski (1897), Pfanhauser (1930), Rzetkowska (1908, 1909), Skorupka (1949), Smoczyński (1955), Wawrowska (1938), Wenic (1878)

Romanian: Slama-Cazacu (1957, 1960, 1962*)

Russian: Aleksandrov (1883*), Blagoveshchenskiy (1886), Gavrilova and Stakhorskaya (1916), Grishakova (1915, 1916), Gvozdev (1948, 1949*, 1961*), Levonevskiy (1909, 1911, 1912), Menchinskaya (1957*), Pavlova (1924), Rybnikov (1926), Rybnikova (1926), Rybinkova-Shilova (1923), Shabad (1925), Sikorskiy (1884), Sokolov (1918), Stanchinskaya (1924)

Swedish: Bolin (1916)

Ukrainian: Bulakhovskiy (1928)

Bilingual Children

Bulgarian-German: Emrich (1938)
English-Garo: Burling (1959*)
English-German: Leopold (1939, 1947, 1949a*, 1949b*)
French-German: Ronjat (1913)
French-Serbian: Pavlovitch (1920)
Georgian-Russian: Imedadze (1960*)
German-Russian: Hoyer and Hoyer (1924*, 1927)

Diary studies have many obvious weaknesses when considered as sources of psycholinguistic data. The sample is, of course, always incomplete, and one does not know the nature of the observer's biases and selective attention in recording utterances. Except for the most recent studies, recording was always done by hand, most often (though unfortunately not always) immediately following the child's utterance.[1] Transcriptions almost always lack detailed information about stress and intonation. Data on comprehension are also almost universally absent as are transcriptions of parental speech and child-parent dialog. Frequently insufficient information about the context in which an utterance occurred leaves its semantic and syntactic interpretation unclear. In addition, the problem of "experimenter bias" remains open. In what subtle ways may the rate and nature of a child's language acquisition and his development of metalinguistic interest be influenced by parents who are continuously and consciously studying and recording his speech.

However, until careful work--such as that currently going on in the USA and the USSR--is done in a number of other countries, diaries remain our only source of cross-linguistic data. When conducted with care, parental observations can yield extremely valuable data. The shining example is the monumental work of the Soviet linguist and teacher Aleksandr N. Gvozdev (pronounced Gvozdyeff) whose study forms the core of this paper. Gvozdev kept a diary of the speech of his son,

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Note--Full references are given in the bibliography

Zhenya, almost daily for the first few years of the child's life, [illegible] recorded his language extensively until the age of nine (1921-1929). The diary was recorded in a phonetic notation, either during the child's speech, or shortly thereafter. Gvozdev's books (1948, 1949) present the huge corpus in several cross-cutting topical arrangements, with continuing intensive and insightful analysis of the material. He characterizes his task in terms of discovering the child's developing linguistic competence, his is clearly interested in discovering the child's *generative* systems, although it appears that he rarely intervened to test his son's comprehension or production by systematic experimentation This is the one major weakness in what is the most exhaustive picture of child language development published to date. Gvozdev avoids the usual errors of diary studies by stressing contrastive analysis of forms in the corpus, usually setting up classes in terms of the child's system, rather than in terms of adult Russian. His study embraces both phonology and grammar (only the latter is discussed in this paper).

Even less thorough diaries, however, can provide data for comparative analysis. In 1928 Gvozdev reported on a comparison of his diary with a number of previous diaries and concluded that:

> In regard to many groups of linguistic phenomena the acquisition of the native language follows a regular and identical course in different children, and this supports the notion that the acquisition of the native language is determined by general psycho-physiological conditions which function in the same fashion in all people and which therefore leave their mark on the structure of language itself (1961:9)

In their broad outlines as elaborated below, the diaries all show initial rapid grammatical development roughly between one-and-a-half and three-and-a-half years of age, during which the basic grammatical relations and categories are acquired by the child. In a period of about two years the child learns to use the universal grammatical devices of word classes and their relative ordering in utterances, grammatical markers, transformations, and prosody. Later learning, universally, has to do with the "fine tuning" of the system--the mastery of morphophenemic details of grammatical forms expressing complex conceptual content, and so forth. Chukovskiy (1961:113) estimates that the Russian child has mastered at least 70 grammatical forms (inflections, conjugations, functions of prefixes and suffixes) by age two-and-a-half . A similar picture of early rapid development is presented by all diarists. These findings are fully in accord with the theoretical position taken elsewhere in this volume by McNeill (and those he cites).

Diarists who have studied more than one child, however, frequently stress the importance of individual differences

> While the preceding chapters succeeded in demonstrating a number of regularities in the principal features of language development, one must, on the other hand, not overlook the fact that, in spite of all these regularities, differences of degree and type abound (Stern and Stern, 1907:252)
>
> It seems to me that the very different observations in regard to the children cited [above] lead to the conclusion that the manner in which a child acquires language is very strongly connected with his individuality (Kaper, 1959:4)

The nature of the individual differences referred to is not very clear, but they appear to be differences between children's strategies and activities in language learning rather than differences in the underlying competence or knowledge of the language eventually built up by the child. Wick Miller seems to have such individual differences in linguistic performance in mind when writing about the longitudinal studies he and Susan Ervin-Tripp have been carrying on:

> There are individual differences in grammatical development. . . some children are more prone to invent their own grammatical patterns, patterns that have no relationship to adult patterns. The early grammatical rules for some are limited and quite regular and for other children they are more variable and more difficult to define. Some children are quite willing to speak at almost any time, whether or not they have the appropriate grammatical structures at hand to express their thoughts, whereas others are more reserved in this regard, and will avoid talking at all, or will use a clumsy circumlocation. . . . I am inclined to think that the variations that are closely tied to formal features of language reflect innate individual difference (1964:

Soviet psychology attributes such innate temperamental differences to an individual's "type of higher nervous activity." Pavlov's original typology of "impulsive, active, tranquil, and weak" nervous system types has been greatly refined and investigated (Teplov and Nebylitzyn, 1963), and a large body of research shows nervous system typology to be reflected in such differential behavior variables as attention span, degree of emotional lability, speech of formation of conditioned reflexes, and so on. There have been interesting theoretical discussions of the influence of nervous system type on the development of given abilities. Although the question remains open, Soviet educators are hopeful that, with appropriate training, basic skills can be established in all children, regardless of type. This point is heavily stressed in regard to facilitating the development of linguistic competence in pre-preschoolers during the time they spend in public nurseries; e. g. :

> . . . in organizing the upbringing of children in the second year of life, and also in carrying out special activities with children, it is necessary to take account not only of their age and level of speech development, but also the individual features of their higher nervous activity (Kalinina, 1963:187)

In regard to individual differences, then, it would seem that similar linguistic competence can be established as a result of various learning strategies.

It is not clear how many children must be studied in order to adequately assess the impact of individual differences upon our understanding of language development, but, as Gvozdev has pointed out, the similarities across individuals--and even across languages being acquired --seem far more striking than the pecularities of given children. Bellugi's systematic comparison of two American children, elsewhere in this volume, bears out this hopeful methodological conclusion.

The following sections of this paper discuss specific aspects of linguistic ontogenesis, drawing, whenever applicable, upon diary studies, Soviet research, and American research. The topics considered are: the structure of two-word sentences, word order, inflections and word classes, and comprehension. Before discussing these specific topics, however, some introductory remarks about Soviet psycholinguistics are in order.

Developmental Psycholinguistics in the USSR

A primary purpose of this paper is to describe the methods and findings of recent Soviet psycholinguistic research on grammatical development in Russian-speaking children. As described elsewhere (Slobin, 1966b), Soviet psychology has had a long and strong interest in language behavior for many years. Psycholinguistics is recognized as a natural union of interrelated disciplines, as pointed out by Rayevskiy:

> ...Soviet psychologists are developing the psychological investigation of the phenomena of language and speech in close connection with the facts of linguistics, without which psychological analysis would be left with no subject matter (1958:7).

The range of linguistic theories influencing psychological research is very wide, including current American and European work, as well as both contemporary and traditional Russian linguistics. An excellent example of current Soviet psycholinguistics is a recent theoretical monograph by A. A. Leont'yev (1965) published as part of a series of psycholinguistic works planned by the Institute of Linguistics of the USSR Academy of Sciences. Leont'yev's long multilingual bibliography includes most of the major American and European linguists and psycholinguists, and recent work in such diverse areas as speech perception, physiology, cybernetics, child development, and sociolinguistics.

A major portion of this active and alert Soviet interest in psycholinguistics is devoted to child language. In a hundred-page review of Soviet psycholinguistics, covering the period 1918-1958, no less than 48 pages are devoted to child speech (Rayevskiy, 1958). Much of this research deals with pragmatic aspects of language development--the development of verbal control of behavior, self-control, inner speech, verbal though, social use of language, and so on. Part of this work has become well known in the West through the writings of Luria (1959, 1961) and Vygotsky (1962), and has been reviewed elsewhere (Slobin, 1966b). Our concern here is with the ontogenesis of language itself.

An important impetus to Soviet interest in linguistic ontogenesis has been the practical task of raising infants and very young children in public nurseries--both day nurseries and boarding institutions. As Lyamina has pointed out, "insufficiencies of group upbringing have an especially unfavorable influence on the development of the speech of children" (1958 119). A concern for special attention to language development is reflected in handbooks bearing such titles as The upbringing of very young children in children's institutions (Shchelovanov and Aksarina, 1960), and specialized guides such as Methods of speech development and native language instruction in the nursery school (Solov'yeva, 1960). (See also Kaverina, 1950). Reports of the efforts made to stimulate early speech development and engage individual children in verbal interaction with adults and with each other can be found in Bauer's collection of trip reports by American psychologists (1962).

Soviet research is heavily influenced by such pedagogical demands, and much work on child language takes the form of training experiments. This orientation goes back to Vygotsky's wise suggestion that intelligence tests should measure not the child's performance at a single point in time, but rather his ability to improve this performance with instruction or aid: "The discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance indicates the zone of his proximal development. ... With assistance, every child can do more than he can by himself--though only within the limits set by the stage of his development" (Vygotsky, 1962:103). Accordingly, a frequently-used technique is to take a group of children in a given age range and require them all to perform a certain linguistic task (e.g., division of sentences into words [Karpova, 1955]). The performance of each child is then qualitatively analyzed, and a classification of performances is set up. The average age of children falling into each performance category is calculated and an attempt is made to establish an ontogenetic sequence of performance types on the basis of such cross-sectional data. Various training procedures are then instituted (e.g., writing individual words on slips of paper, moving a plastic counter on uttering each word in a sentence, etc.) and it is generally found that certain training procedures are most effective with children at given stages, that rapid advance is more possible in some stages than in others, and so forth. An outstanding feature of this research is the use of long-term training experiments, stretching over weeks or months of a young child's life.

Children as young as nine months have served as subjects in studies of language development (Mallitzkaya, 1960). In many cases, then, Soviet investigators are in a position to manipulate the actual beginning stages of language development itself. Many pedagogical experiments no doubt become the "didactic games" described in nursery school handbooks. And, indeed, many such games described in the handbooks can easily serve as useful eliciting devices and comprehension tests for research in developmental psycholinguistics (e. g., Solov'yeva, 1960: 103-105). For example, the following didactic game, designed for children aged three to four, is a ready-made eliciting procedure for gender agreement between adjectives and nouns. (For transliteration guide, see bibliography).

> Didactic and other toys--for example colored wooden rings, balls, eggs, and bowls--are put in a bag. The teacher calls children up one by one and asks them to take a toy out of the bag and name it and its color (size can be included too, if toys of two sizes are put in the bag). It must be remembered that the children must reply as follows: blue ring [goluboye kol'tzo]or blue ball [goluboy sharik]. If the children say: ball of blue color [sharik golubogo tzveta], then the exercise loses its point, since the adjective blue [goluboy] will always agree with the word color [tzvet] (masculine gender), while it is necessary that the children make the adjective agree with the name of the toy. (Solov'yeva, 1960:103).

In all of their work on child language the Soviets have been impressed by the child's "autogenic" behavior. Soviet psychologists have not been attracted by the sort of mechanistic and imitation-based, passive models of language acquisition so long popular among us. Nothing could be further from their theoretical position than the assertion by Wundt that: "Child language is a production of the child's surroundings--a production in which his participation is essentially only passive" (Quoted by Stumpf, 1901:296). Quite the contrary, El'konin, one of the Soviet Union's leading developmental psychologists, says: "It is perfectly clear that [language development] is not a mechanical process in which the child acquires each separate linguistic form by means of simple repetition"(1958).

Perhaps the delightful neologisms for frequently produced by Russian children--facilitated by the rich productive morphology of Russian--have helped to keep Soviet psycholinguists from passive acquisition models. The Russians see first-language learning as a highly active, creative process, rivalling the productions of the poet and artist in subtlety and originality. A Gvozdev has put it: "The keenness of the child's observations and the artistic clarity of many childish words are common knowledge; they are truly very close to the linguistic creativity of literary artists. We are therefore dealing here with authentic creativity, attesting to the linguistic endowment of children" (1949:2:187).

Two-Word Sentences

For almost all children for whom sufficient data are available, the earliest stage of two-word utterances can be characterized by the definite structure called "pivotal constructions" by Braine (1963a). Even with a fairly small diary corpus one can, on distributional grounds, separate two classes of words occurring in two-word utterances. There is a small class of what have been called "pivot-words" by Braine or "operators" by Miller and Ervin (1964), and a large, open class of words, many of which were previously one-word utterances. For example, a child may say things like: bandage on, blanket on, fix on, take on, and many other sentences of this type. The word on is a sort of "pivot" here--it is always in second position, and a large collection of words can be attached to it. The child may also say things like: allgone shoe, allgone vitamins, allgone outside, and allgone pacifier. In this case one can say that there is a pivot in first position--allgone--

which is followed by a large class of words in the child's speech. On distributional grounds, then, it seems that one of the classes is small and contains words of high frequency in the child's speech. The membership of this class is stable and fairly fixed; these words can be called pivots because other words can be attached to them. A pivot-word may be the first or the second member of a two-word sentence--but whichever it is, its position is generally fixed. The membership of the pivot class expands slowly--that is, few pivots enter each month. The other class is large, open, and contains all the words not in the pivot class. All of the words in this open class also occur as single-word utterances, but some of the pivots never do.

The longitudinal studies of Braine (1963a) Brown and Fraser (1963), and Miller and Ervin (1964) all confirm this basic picture. A similar picture is clearly indicated in the records of Leopold (1949a, [German-English]), Gvozdev (1949, [Russian]), Stern and Stern (1907, [German]), and is suggested in other diaries as well (Bulgaria, French, German, Japanese, Polish). Only Burling, reporting on his Garo-English bilingual son, reports that: "One simply cannot reasonably speak of a two-morpheme stage of his speech development" (1959:65). All other investigators state that child grammar begins with unmarked forms (e.g., Russian nouns and verbs in what correspond to nominative singular and infinitive), and relies on situational support, gesture, prosody, and perhaps positional word classes (pivots) as elementary communicative devices. Two-word utterances generally emerge sometime in the second half of the second year, and quickly give way to longer utterances. For Zhenya Gvozdev, for example, two-word sentences appeared at about 1;8 (i.e., one year and eight months). At first there were only a few such sentences, but they became the usual utterance type by 1;9 and by 1;10 were replaced in frequency by longer sentences.

This pre-inflectional stage is facilitated in some inflectional languages, by the use of "baby words" (*Ammensprache*, *yazk nyan*') which can take no inflections. These words invariably occur as pivots. Examples from Russian are: *tprua* (go walking), *bay-bay* (sleep), *tyu-tyu* (allgone, disappeared), *bo-bo* (hurt), and *bukh* (fell down). Similar uninflectable baby words are found in German, and, for that matter, in English (e.g., *bye-bye* or *go bye-bye*, *night-night*).

The child draws other pivot-words from the standard language. Miller and Ervin note that: "There was some tendency for the most frequent models of operators [cf. pivots] to be words which could serve as substitutes for lexical classes and carry stress, i.e., pronouns (demonstratives) rather than pure noun determiners, particles of two-word verbs rather than pure prepositions" (1964:23). This suggestion also finds support in the diary literature. In fact, some verb particles enter child speech at the one-word stage as action indicators, as in the case of Leopold's daughter who used the following before the two-word phase: *up*, *aus*, *auf*, *mit away*, and *on/an* (the model here is both English and German), and later as pivots in two-word sentences.

Table 2 presents examples of pivot structures from several languages. Their similarity is striking. Without forcing, a classification of their conceptual content seems to reflect basic universal categories of syntax and semantics. (See table 2 on page 15)

The universality of negative pivot sentences is notable. Somewhat later the first negative sentences seem always to follow the English pattern of Stage 1 as described by Bellugi in this volume:

$$\left\{\begin{matrix}\underline{\text{No}}\\ \underline{\text{Not}}\end{matrix}\right\} - \text{S} \qquad \text{or:} \qquad \text{S} - \left\{\begin{matrix}\underline{\text{No}}\\ \underline{\text{Not}}\end{matrix}\right\}$$

The identical pattern is reported in other English cases (Leopold, 1949a; Snyder 1914), German (Stern and Stern 1907; Stumpf 1901),

Table 2

Pivot Structures in English, German and Russian

Function of Pivot	Language		
	English	German	Russian
Modify, qualify	pretty--	armer [poor]--	--bo-bo [hurt]
	my--	mein [my]--	--khoroshaya [good]
	allgone--	alle [allgone]--	--tyu-tyu [allgone]
	all--		
	big--		
	other--		
Locate, name	there--	--da [there]	--tam [there]
	here--	da-is [there is]--	
	see--	gukuk [see]--	
	it--		
	that--		
	--on-there		
	--up-there		
Describe act	--away	--bah [away]	--tprua [walk]
	--on	--an [on]	--bay-bay [sleep]
	--off	--auf [on]	--upala [fell down]
	--it	--aus [off]	--bukh [fell down]
	--do		
	--come		
	I--		
Demand, desire	more--	mehr [more]--	eshche [more]--
	give--	bitte [please]--	day [give]--
	want--		
Negate	no--	nein [no]--	net [no]--
	don't--	nicht [not]--	ne-nado [don't]--
Call, salute	hi--		
	bye-bye--		
	night-night--		

Note--The dash in each utterance indicates the position of the open-class word occurring in the position complementary to the pivot. E.g., in the first example the dash following 'pretty' could be replaced by a number of words, giving such utterances as 'pretty ball', 'pretty hat', 'pretty Mommy', etc.

French (Grégoire 1937; Guillaume 1927b), Italian (Lombroso, referred to in Rzesnitzek, 1899), Polish (Kaczmarek 1953), Bulgarian (Gheorgov 1908), Russian (Gvozdev 1949, with references to a number of other diaries; Shchelovanov and Aksarina, 1960), and Japanese (McNeill and McNeill 1966). Thus, regardless of the form of negation in the input language, and regardless of the position of the negative element, the primitive form appears, so far, to be a universal. (Rzesnitzek also points out that this is the form of negation used in the sign language of the deaf.)

In all of the languages studied it is clear that many of the child's utterances at this stage (as well as at later stages)--although consistent with his system--do not directly correspond to adult utterances, and do not look like reduced imitations or abbreviated, delayed recall of adult utterances. In Russian pivot sentences inflectional suffixes (not yet functional in the child's speech) often reveal that a sentence could not have been a reduced imitation, but must have been composed by the child. For example, Gvozdev's son, at 1;11, said day lyapa, 'give hat', using the noun lyapa (=shlyapa) in what corresponds to its nominative form in adult language, while the only possible adult model sentence could have been day shlyapu, placing an accusative suffix on the noun. Since the child does not yet use inflections, he has taken the word in the only form present in his vocabulary--in this case the nominative singular--and placed it in the appropriate position relative to a pivot. The pivot stage is rich with charming examples of childish utterances which do not seem to be simple or direct derivation from adult forms. For example, in Braine's data (1963a) we find such utterances as: allgone sticky (after washing hands), allgone outside (said when door was shut, apparently meaning 'the outside is all gone'), more page ('don't stop reading'), more wet, more car ('drive around some more'), more high ('there's more up there'), there high ('it's up there'), other fix ('fix the other one'), this do ('do this').

Other facts also argue for a generative, productive system even at this early stage of language development. When two-word sentences appear in a child's speech they very rapidly become the dominant utterance type, and hundreds of new utterances of this form are produced in a very short time. For example, Braine (1963a:2) reports the cumulative number of different word combinations recorded for one boy in successive months as: 14, 24, 54, 89, 350, 1400, 2500+. Both Russian and American investigators have noted that new pivots often seem to be playfully practiced, the child uttering series of pivot sentences, holding the pivot constant and substituting a variety of words from the open class. For example, Zhenya Gvozdev at 21 months was heard practicing the pivot-word prua "walk" in combination with names of people and animals: Lena prua, Tosya prua, kiska prua, and so on (Gvozdev 1961:163).

Most students of child language have not carried out the necessary distributional analysis to discover pivot structures, and have spoken of the "chaos", "arbitrariness", and "randomness" of word order in early stages of grammatical development. Pivot structures, however, clearly are structured (although word order may appear more capricious in longer and more complicated sentences). Another source of confusion to earlier investigators may have been lack of data on stress and intonation, which are extremely important devices for distinguishing sentence types in early childhood. While they were aware of the importance of prosody in a general sense--especially sentence intonation contour--stress patterns were almost entirely ignored (as one might expect in the days before tape recorders). The recent work of Braine, Miller and Ervin-Tripp, and Roger Brown's group, however, has revealed the importance of stress patterns in the analysis of child speech.

Shortly after the emergence of pivot constructions, or contemporaneous with them, the child also utters two-word sentences in which both words are drawn from the open class. In such sentences an open-class word can take either utterance position. Braine offers the example of man'car ('a man is in the car'), and car bridge ('the car is under the bridge') (1963a:10). He points out that, while these are not pivot structures,

> They may form constructional homonyms with pivotal constructions, e.g., baby chair ('little chair': pivotal construction), usually without an intonation break, and báby # cháir ('the baby is in the chair'). The two constructions, however, certainly cannot always be distinguished from their intonation alone (# is used here...as a general juncture symbol) (1963a:10-11).

Ervin-Tripp has noted the importance of stress in distinguishing between different types of utterances consisting of two-open-class words:

> Sentences which lack pivots sometimes give an impression of syntactic anarchy, but some observers have reported prosodic cues of subclasses such as verb vs. noun or locative vs. possessive (Miller and Ervin, 1964). Thus 'Christy room', if the first vowel was stressed was a possessive, if the second a locative construction. Generally order contrasts alone did not signal semantic differences as they do in adult English (in press).

The last point is provacative. Child language at the two-word stage certainly relies on position of elements. Not only do pivots have a fixed position, each one occurring in only first or second position, but other regularities have been noted at this stage. Both Brown (unpublished data) and Leopold (1949a) have noted a distinct tendency for animate nouns to precede inaminate in English noun-noun constructions (and consequently, subject generally precedes object), and subject almost invariably precedes verb in all of the diaries examined (English, Russian, Bulgarian, German--though the Sterns [1907] note a predominant verb-subject order for their first daughter). Thus relative order of classes of words seems to be important in the beginnings of child language. But, in addition, stress patterns, expressive gesture and intonation, and clear situation supports play additional important roles in making these simple utterances meaningful.

The problem of word order in child language is taken up in the next section. It remains to point out here that, as McNeill has shown for English (1966b), the two-word utterances of children appear universally to express the basic grammatical relations of subject-predicate, verb-object, and modifier-noun. All of the utterances recorded in the diaries--regardless of their strangeness--are clearly examples of human language, embodying the same basic features as languages spoken by adult human beings everywhere on the planet.

Word Order

All of the diaries, in all of the languages examined, report that the child begins to string unanalyzed words together before he begins to use such grammatical markers as inflections, articles, and so on. The only possible exception presently available to the universal statement that syntax develops earlier than morphology is Burling's study (1959) of his son's learning of Garo (a Tibeto-Burman language). But this counter-statement is a qualified one, and, as he himself has pointed out, is not radically opposed to the child language universal.[2] All of the world's languages make use of order of elements in their grammatical structure, but not all languages use bound forms. It is therefore not surprising that, regardless of the input language, the child's "language acquisition device" seems to operate on the assumption that order of elements plays an important role in the language he is acquiring. A comparative examination of the acquisition of languages in which order plays distinctively different roles casts light on the child's use of this putative assumption.

The problem of word order has loomed large in the recent theoretical debate between Braine (1963a, 1965) and Bever, Fodor, and Weksel (1965a, b), prompted by Braine's assertion that "'What is learned' are primarily the proper locations of words in sentences" (1963b:324). In the course of their debate both sides have sought evidence on the acquisition of an inflected language like Latin or

Russian to support their positions. The question is whether the relatively freer word order allowed by an inflected language poses difficulties to Braine's theory of "contextual generalisation" in language acquisition. Most investigators of English child language have reported that non-standard orderings of subject, verb and object in two- and three- word sentences are quite infrequent, and it has been suggested that the rigid word order of English syntax accounts for the order of elements in child sentences, and for the formation of word classes (cf. also Jenkins and Palermo, 1964). Bever, et. al. (1965a) have pointed out, however, that even in English, which does not make great use of inflectional devices, word order is not as important a feature of syntactic structure as might be imagined. And, at any rate, they emphasize that the order of elements which is relevant to language learning is that occurring in the deep structures of sentences:

> The difference between an "ordering" language and an "inflected" language is one which concerns the manifest sentence only: The structure of the underlying forms is similar in both types of languages as are the kinds of transformations which apply to the underlying representations.
>
> In general the rules which determine inflection are formulated with reference to the order and function of elements in an underlying representation of a sentence (Bever, et. al., 1965a:478).

Braine, on the other hand, is dubious of the transformationalists' distinction between deep and surface structure, and believes the relevant cues for language learning to be position of elements in spoken sentences:

> The major cues in Latin (or Russian) are based on relative position. The subject of the sentence is the element which occurs immediately before the nominal-case suffix; the object is the element immediately before the accusative-case suffix, the verb is the element to which suffixes comprising tense, mood, voice, aspect, and person morphemes are attached, etc. It is the learning of these kinds of relative positional relationships which has to be explained in giving an account of the learning of the grammar of an inflected language like Latin (1965:489).

The acquisition of Russian provides appropriate data to apply to this argument. The language has a rich noun-inflectional system and no articles. Thus the six possible orderings of subject, verb, and object all occur as grammatical sentences, and are stylistic variants of one another.[3] It would seem, then, on Braine's account, that the Russian child, being exposed to a great variety of word orders, would first learn the morphological markers for such classes as subject, object, and verb--as suffixed to members of the appropriate word classes--and combine words thus marked in any order. This is, however, hardly the case. Child grammar in Russian, as in English, begins with unmarked forms, as noted above. Morphology develops later than syntax, and word order is about as inflexible for little Russian children as it is for Americans. The flexibility of adult Russian word order depends on the inflectional systems, which are still lacking at the time of emergence of simple three-word sentences.

This interesting finding seems to support McNeill's suggestion (1966) that children begin by speaking base strings directly. In the Latin example offered by Bever, et. al. (1965a:478), the six stylistic inversions of Puer amat eam are based on a single underlying form to which features of case and number are applied before subsequent re-orderings. (See also Chomsky, 1965:174, and fn. 35, pp. 221-222.) Bever, et. al. affirm that

> The inflection of words in manifest sentences thus depends on the order of elements in their underlying representations. Inflection is a direct reflection of the underlying form.[4] We have already seen that languages which constrain manifest order do so as a way of exhibiting underlying structural relations. Thus the difference between inflecting and order language is a matter of how the underlying relations are reflected in the speech signal. (1965a:478).

This difference apparently does not exist between Russian and English child grammar in the earliest stages. Thus we have the beginning of an answer to Braine's objectiion that

> The analysis of Latin provided by Bever, et. al. leads to curious problems. If the "underlying strings" generated in the phrase structure have a rigid word order, then it must be assumed that the learner learns this order, even though no such order is visible in the language. It is difficult to see how the learner could learn this, or why one should want to postulate that he does (1965:489).

In fact, the Russian child does seem to learn a rigid word order, though one would be hard pressed to demonstrate, on the data presently avaiable, that this is the order of the underlying strings generated in Russian phrase structure. A preliminary answer to the rest of Braine's objection can be found in the theoretical writings of Katz and McNeill, elsewhere in this volume. The answer still has many "ifs", and is far from satisfying at present. If indeed order of elements is a universal attribute of deep structures (and transformationalists are far from agreement on this difficult question),[5] and if indeed children's innate equipment prepares them to "talk base strings directly" (another moot point), one would expect the early utterances of children to be ordered, regardless of the role played by order in the surface structure of the sentences they hear. More simply, children may expect the order in which communicative events occur to be an important determinant of their meaning. (More on this later.)

Given that the order of subject, verb, and object appear in a relatively fixed sequence in Russian child speech, what order might we expect to find? Jakobson states that of the six possible orders

> only the order SVO is stylistically neutral, while all the 'recessive alternatives' are experienced by native speakers and listeners as diverse emphatic shifts. SVO is the only word order initially used by Russian children; and in a sentence like Mama ljubit papu 'Mama loves papa', if the order of words is inverted--Papu ljubit mama, small children are prone to misinterpet it: "Papa loves mama", as if one had said, Papa ljubit mamu. Correspondingly, Greenberg's first universal could be restated as follows: In declarative sentences with nominal subject and object,

> the only or neutral (unmarked) order is always in which the subject precedes the object. If in a language like Russian the nominal subject and object are not distinguished by morphological means, the relative order SO is compulsory--Mat' ljubit doč 'Mother loves daughter'; inversion of the nouns would mean, 'The daughter loves the mother'. In languages without distinctive characteristics of object, and subject, the order SO is the only one admissible (1963:212-213). (Chomsky, 1965:126-127).

Jakobson's statements about Russian child language--though they may be based on extensive observation and examination of diaries not available to this study--are not fully confirmed by the scanty data at hand. Gvozdev reports that the overwhelming majority of Zhenya's first sentences of this type were in the order SOV. Note, however, that this order is consistent with Greenberg's universal that subject always precedes object in the dominant order, and with his finding that SOV and SVO are the two most common patterns (1963:61). In fact, although SOV is at first the dominant order in Zhenya's speech, it is later replaced by SVO.

The only other applicable Russian data are from Menchinskaya's diary, in which SVO and SOV appear in about equal numbers. This is also true of the German diaries examined. In English and Bulgarian, which exhibit more regular order than Russian and German, the dominant order is SVO. In all cases, the other four possible orders are extremely rare (as Greenberg also notes in his study).

It is curious to note that SOV is apparently the standard order in the sign language of the deaf, regardless of the speech community in which they live. A. A. Leont'yev reports:

> It is required that two objects, between which an action occurs, be communicated first; only after the interacting objects are known can the action itself or the relation between them be demonstrated. In sign language a definition applied. In sign language, one cannot say: 'The boy ate the red apple'. Gesturally one must sign: 'Boy apple red eat' (1965:203-204).

Leont'yev notes that structural errors in the verbal speech of the deaf also follow this pattern (e.g., 'Boy bird feeds' [*Mal'chik ptichka kormit*]), as do children's invented languages noted by Stumpf (1901--German-based), Luria and Yudovich (1956--Russian-based), and Saareste (1938--Estonian-based), as well as in Russian child speech as noted by Gvozdev. Given these diverse examples, one is left wondering why SOV is not a universal feature of early child speech!

In regard to order of elements, Gvozdev makes the intriguing suggestion, on the basis of his son's speech development, that forms learned more recently at first appear later in sentences (1949:2:33-35). As one example he cites the elaboration of one-word utterances to two-word SO sentences and, with the later acquisition of new verbs, to SOV sentences, although SVO is dominant in adult Russian. For example, the first stage the child may say *mama*; at the second, *mama niska* ('mama book'); and at the third, *mama niska tzitatz* ('mama book read'). This interpretation is also applied to the frequent occurrence of OV utterances in Zhenya's speech (a widespread phenomenon in the speech of Russian two-year-olds, according to Shchelovanov and Aksarina [1960:172]).

As other examples of his theory that new items are tacked onto the ends of sentences, Gvozdev points out that: (1) personal conjugations of the verb are developed later than the infinitive, and, in sentences, follow the infinitive, although the usual Russian word order is the reverse (e.g., *spat' khachu* 'to-sleep I-want', *mama kupat' myasa padyot* 'mama to-buy meat will-go'); (2) numerals, measure adverbials, adjectives, and possessive pronouns all develop later than nouns, and at first follow nouns in the child's speech, again, contrary to standard Russian word order (e.g., *itzku dva* 'egg one', *vada noga* 'water much', *kubik bal'saya* 'block big', *pyero tvayo* 'pen your').

Regardless of the validity of this rather puzzling theory, note that Gvozdev could only have made the above generalizations if in fact word order was a regular feature of his child's speech.

A major weakness of all such statements about word order (and other aspects of child language) is that data on the child's comprehension are almost never available. Jakobson's test of children's understanding of inverted order is an important one. Such tests should ideally accompany any assertion about a child's underlying grammar. The only examples of systematic study of comprehension of word order come from Roger Brown's group. When one of their subjects, "Adam", began to use subject-verb-object constructions his understanding of such constructions was tested by his ability to correctly respond to instructions to manipulate objects (e.g., "Show me 'the boat pushes the duck'"). His performance at this stage was confident and correct, indicating the SVO sentences were not only produced but comprehended (pers. comm.). Working with three-year-olds, Fraser, Bellugi, and Brown (1963) found that passive sentences were understood as SVO (e.g., "Show me 'the dog is chased by the cat'" led children to point to a picture of a dog chasing a cat), again demonstrating that children attend to the order of elements in a sentence as bearing meaning, and attend more to order than inflections (as in Jakobson's test). When a child consistently uses and understands the rule that subject precedes object in declarative sentences it is clear that contrastive word order has begun to play a role in his language: He knows that 'man bites dog' and dog bites man' mean two different things; his simple sentences are not "chaotic juxtapositions" of words. It is highly important to know, of course, whether grammatical devices are understood even before they are used consistently by the child. The relevant data to answer this question are almost non-existent.

Deviations from standard word-order have often been looked upon as stylistic variations--in adult as well as child speech. Most diaries point out the occurrence of sentences in which the psychologically most important word is placed first. For example, Leopold says:

> On the whole, the words of Hildegard's brief sentences, were arranged as in the standard languages [English and German . The utterances in which the word-order differed from that which the adult speaker considers normal were exceptional... the placement of the object in first position must be explained as due to the desire to give the "psychological subject", the item of dominating interest, an emphatic position.

The latter is often the explanation for most examples of irregular word-order. It is often observed in child language. My shoe brush 1;10, if it meant "Brush my shoe", is exactly parallel. So is Mama wake up 1;10, Mama being the object, not a vocative: "I am going to wake up Mama". The imperatives Coat button and nose blow 1;11 are easily explained in the same manner (1949a:70).

Such inversions for emphasis also occur in adult speech. As Chomsky points out (1965:222), even English allows such forms as 'him I really like', and 'him I would definitely try not to antagonize.' Likewise, the Sterns point out that children, as opposed to adults, use word order for emphasis (e.g., Das Mess will ich haben) much more frequently than they use stress placement (e.g., Ich will das MESSER haben). The Sterns conclude: "Thereby word-order can become the natural symbolism of value order" ("Es kann somit die Wortfolge zur naturlichen Symbolik der Wertfolge werden") (1907:201).

In a sense such stylistic inversions again show a tendency for children to prefer order over other grammatical devices. Although inflections are absent, situational support and other semantic factors generally save children's early sentences from ambiguity. Generally the subjects are animate and the objects inanimate, so that, even when reversed, it is clear which of the two nouns is subject and which object. As Pocheptzov has pointed out (1961:10), such sentences can appear in OVS order in Russian even when subject and object are not morphologically marked (e.g., Novyy sezon otkryvayet Bol'shoy teatr 'The Bolshoi Theater is opening a new season'). The sign language of the deaf also allows subject and object to be reversed when they are semantically marked. A related semantic factor is pointed out by Miller and Ervin:

> It seems surprising that the children's relatively systematic arrangement of classes could be sustained with so few overt markers. One explanation may be the relative semantic consistency of English lexical classes for the words in young children's vocabulary, a fact pointed out by Brown (1958:247). ...Thus it may be that regularities of order are aided by the additional cue that isprovided by semantic similarities between items in a class (1964 24).

Inversions are generally used for affective communication, and do not seem to play a central role in grammatical development. The diary evidence suggests that their role may be such as is suggested by Chomsky:

> In general, the rules of stylistic reordering are very different from the grammatical transformations, which are much more deeply embedded in the grammatical system. It might, in fact, be argued that the former are not so much rules of grammar as rules of performance. In any event, though this is surely an interesting phenomenon, it is one that has no apparent bearing, for the moment, on the theory of grammatical structure (1965:127).

An experiment of El'kin (1957) suggests that children may be especially sensitive to sublte implications of word order. He conditioned an eyeblink response to sentence as stimuli in subjects aged 10 to 14. In children in the 12-14 year old range, changing theword order in the stimulus sentence[6] had no decremental effect on the conditioned reflex activity. The reordered sentences were grammatical and synonymous with the original sentences, and apparently were treated as very similar or identical stimuli to which conditioned responses generalized. This was not the case, however, for the younger children. Their responses tended not to generalize or reorderings. Perhaps for children as old as 10 or 11 the reordered sentences were somehow not quite the same stimuli as the original sentences.

One last point should be made about word-order. Most of the diaries show that incorrect orders become more frequent as sentences increase in length. It is at this stage that many of the statements about "random word-order" seem more appropriate. But the misorderings here are generally not of individual words, but of phrases or constituent structures. For example, Gheorgov reports many mis-orderings of direct and indirect object in Bulgarian child speech. Nazarov (1964) studies 5,918 sentences from Russian school compositions written by children in grades 7-10, and found 40.7 per cent of them to have standard word order, 25.5 per cent to have correct inversions, and 3.8 per cent to have incorrect inversions. In all of these examples of incorrect word-order, however, the words are correctly inflected. The children's problem seem to be one of findings the correct word-order in surface structure for words already inflected on the basis of their role in the deep structure of the sentence.

Morphology

Emergence of Inflections

Almost all of the diarists note that inflections emerge suddenly generally a few months after the beginning of two-word sentences. For example, Velten reports, for his English-speaking daughter: "In swift succession there appear prepositions, demonstratives, auxiliaries, articles, preterite forms, conjunctions, and possessive and personal pronouns" (1943:290). Leopold notes that conjugation, declension and comparison enter at almost the same time in the speech of his German-English bilingual daughter. The Sterns likewise note the rapid emergence of inflections in the speech of their children, and in other German diaries. Burling reports a similar rapid emergence of suffixing in Garo. In the Russian of Zhenya Gvozdev all words are unmarked until about 1;10, and in the one month between 1;11 and 2;0, there is a sudden emergence of contrasting morphological elements in various grammatical categories.

In this one month, previously unmarked nouns are marked for: (1) number, (2) nominative, accusative and genitive cases, and (3) diminutive; verbs are marked for: (1) imperative, (2) infinitive, (3) past tense, and (4) present tense. Gvozdev notes similar phenomena in other Russian diaries. Apparently once the principles of inflection and derivation are acquired--or, at any rate, the principle of suffixing--the principle is immediately applied over a wide range of types. It has been frequently pointed out, however, that constant application of a rule is a much more difficult problem to a child than mastery of the rule. When a child does use a given form, it is almost always appropriately used, but it may not always be used in cases where it would be appropriate.

It is especially in the area of morphology where Russian is so rich, that Soviet studies provide many striking examples of principles which are often difficult to discern--or to discern in many embodiments--in studying English-speaking children. This matter is simultaneous emergence of a grammatical principle in several domains can be seen repeatedly in Russian children. The following examples are drawn from Zhenya Gvozdev's speech development.

(1) Between the ages of 2;10 and 3;0 gender agreement appeared simultaneously in two domains--both in regard to adjective-noun agreement and noun-past tense of verb agreement.

(2) When a new grammatical case enters, it serves several functions at once. For example, between 2;0 and 2;2 the first datives were used--and they were used both to indicate the indirect object of action and directed motion toward an individual. In these same two months the instrumental also emerged, being used immediately to indicate the instrument of action, mutuality of action, and goal of action (in consonance with these uses in adult Russian, but lacking the required preposition in the latter two examples). One has the impression

that the child understood these semantic distinctions before he began using the declensions--when his nouns were still unmarked--and that rapid acquisition and differentiation of the markers and their senses reflects this earlier knowledge. Unfortunately, comprehension tests on this point are lacking.

(3) Shortly after grammatical cases enter, the child begins to use a variety of prepositions with them. (Prepositions control case selection in Russian.) Between 2;4 and 2;6 Zhenya began to use eight different new prepositions, combining them with nouns in five different grammatical cases. Again, the principle is suddenly and widely applied to an entire domain--and to the correct domain.

Note that the child has no apparent difficulty in discovering morpheme boundaries. From the very beginning of inflections one sees a free use of word stems combined with a hugh variety of bound morphemes. The word stem and the suffix are both clearly "psychologically real" units. Levina has noted the remarkable fact of Russian child speech that

> clarity and accuracy of pronunciation appear first of all in the inflections. At the same time the word stem continues to sound inarticulate. ...The work carried out by the child in connection with rudimentary distinctions of grammatical meanings...facilitates more articulate perception of the acoustic composition of words at this stage (quoted by Leont'yev, 1965:101).

The development of inflections, of course, permits the freer word order of Russian discussed at length in the previous section. At first Zhenya Gvozdev uses the accusative suffix (-u) only in two-word sentences. At age 1;10 an important contrast is recorded: niska lisit 'book [nominative] lies', and nisku tzitatz 'book [accusative] read'. Once marked contrastively for nominative and accusative, the position of the noun in sentences gains more freedom. While unmarked object nouns always followed subject nouns, nouns bearing the accusative inflection (and only nouns so marked) can also precede the subject.

A few properly marked OSV sentences occur. The child is no longer speaking universal child language, but a childish form of Russian.

Order and Rate of Inflectional Development

Although the general principles of inflection are acquired early and quickly, complete mastery of morphological and morphophonemic details requires years of effort on the part of the child. Govzdev, for example, notes that by age three Zhenya knew all of the generic grammatical categories (case, gender, tense, and so on) and had a good idea of their meanings. No new uses of grammatical cases entered after 3;9. But it takes the Russian child until age seven or eight to sort out all of the proper conjugational and declensional suffixes and categories, rules of phonological conditioning of morphemes, stress and sound alternations, and the like. The American child is believed to have essentially mastered English at a somewhat earlier age, but comparisons such as this are illusory. Basic grammatical categories and rules seem to be universally mastered by about age five or six. Naturally, the subsequent learning of fine points depends on the language. The American child does not have a complicated inflectional system to master, but school-teachers know that it takes him a number of years at school age to attain full mastery of the auxiliary and tense systems, the subjunctive, quantifiers, and other aspects of the adult language. In these years the Russian child is struggling with inflections (as well as other details). It is not yet possible to adequately compare the late accomplishments of the American child with those of the Russian child. The unanswered question is whether the speech of a Russian seven-year-old is heard as more deviant than adult speech than is the speech of an American seven-year-old of comparable social and educational background.

It is important to note that when the Russian child does make inflectional errors, they are errors of detail, rather than major category errors. Gvozdev points out that although there are many confusions as to the proper suffix to emply within a case category, the child never uses one cases instead of another (after he has begun to use case-endings productively) (1949;2:84). Miller and Ervin come to the same conclusion in regard to English-speaking children:

> The children seldom used a suffix or function word with the wrong lexical class... the only examples of this kind of mistake were provided by Susan: *I by-ed* where the adult would say *I went by that*, and *stand up-ed*, where the adult would say *stood up*. In the second example it could be argued that the *-ed* was not added to the wrong word class, but rather was added to the verb phrase instead of the verb (1964:26).

Three broad classes of interacting variables seem to account for the rate and order of acquisition of grammatical devices: (1) their frequency of occurrence in the child's speech environment, (2) their formal complexity and diversity, and (3) the semantic content which they express.

These variables interact in various ways in various cases. For example, the development of the passive is typically late in English and German, and always comes long after mastery of the active (Ament, 1899; Fraser, Bellugi, and Brown, 1963; Harwood, 1959; Lindner, 1898; Preyer, 1900; Stern and Stern, 1907). The semantic content of the passive presents no problem--it is identical to that of the active. Its lateness is no doubt due to its low frequency of occurrence, its morphological complexity, and its violation of standard word order.

Slama-Cazacu (1962) in a study of some 200 Romanian children between the ages of two and seven, comes to the conclusion that when the language offers a choice between an analytic and a synthetic form to express the same content little children prefer the former. Her data are on the development of the oblique cases. For example, little children's version of the possessive is the uninflected form with an article, *a lu păpusica* ('of the doll'), rather than the inflected *a păpusicii* ('the doll's'). Likewise in the dative the child's form is *face mincare lu păpusica*, rather than *face mincare păpusicii* ('she/he cooks for the doll'). Slama-Cazacu argues that stringing along unanalyzed forms in a fixed order is easier for children than mastering the complexities of the inflectional system. As in the case of the English and German passive, however, several variables are confounded in this argument, because Slama-Cazacu points out that the analytic forms are also used less frequently in adult colloquial speech (whereas "the synthetic forms are preferred because more literary" [personal comment]).

David McNeill (1966a), studying Japanese child language, is concerned with the development of postpositions as indicators of the basic grammatical relations of underlying sentence structure (cf. Russian inflections). He believes that the nature of transformations governing different postpositions, rather than frequency of occurrence influences their order of emergence in linguistic ontogenesis:

> Japanese has two postpositions, *wa* and *ga*, which obligatorily follow the surface-subject of a sentence. They have nearly identical distributions, never co-occur, but *wa* is used twice as often as *ga*. However, only *ga* is introduced by a transformation that operates on the underlying subject, and only *ga* appears in the early speech of children (McNeill, personal comment).

In other cases the formal means of expression are not complex, but the semantic content retards their emergence. Such are the late-emerging comparative and superlative in most languages, which require conceptual tasks of comparison of phenomena, and the Russian conditional. Kenyeres (1927) attributes the late emergence of the conditional in Hungarian to its infrequency of occurrence and the child's lack of interest in the semantic content expressed (viz. Potentiality), but does not give information as to the formal complexity of this construction in Hungarian. The subjunctive is similarly late in English and German.

Soviet psycholinguists (El'konin, 1958, 1960; Feofanov, 1958; Gvozdev, 1949; Zakharova, 1958; and others) interpret the order of emergence of inflectional classes in terms of the relative semantic or conceptual diffiuclty of various classification criteria for children. One line of evidence in this argument is the observation that lexical items referring to certain semantic categories appear at the same time as those categories become morphologically marked in a child's speech. To take examples from Shenya Gvozdev, at 1;10 one finds the first use of the word mnogo ('much', 'many') at the same time as the singular-plural distinction in noun markings. The words for 'right away' and 'soon' enter at the same time as the future tense. The lexical expression of directed motion--syuda ('hither'), kuda ('whither')--emerge simultaneously with the use of the accusative expression directed motion (but lacking the directional preposition).

An attempt is made to set up the following rough order of acquisition of morphological classes, in reference to their meanings:

(1) Those classes whose reference is clearly concrete emerge first. The first inflection is the noun plural,[8] at 1;10, followed shortly by diminutive suffixing of nouns. The imperative, with its immediate, expressive character, also appears very early.

Within classes order of emergence is also tied to reference. When the accusative enters Zhenya's speech it is first used only to mark nouns which are direct objects of verbs clearly expressing action, especially the action involved in moving objects ('give', 'carry', 'put', 'throw'), and only rarely in connection with such verbs as 'read', 'draw', and 'do' , which are more removed from the semantic core of "verbness."[9] Within the preposition class, Feofanov points out, in reference to common prepositions, that: "Initially their use is confined to relations with a concrete meaning understood by the child from visual perception (space relations, relations involving mutuality...), then it extends to relations without such visual support (relations of purpose, time relations, and space relations used figuratively)" (1958:124).

(2) Classes based on relational semantic criteria--cases, tenses, and persons of the verb--emerge later than those with concrete reference.

(3) The conditional is very late, not being used until 2;10, though its grammatical structure is exceedingly simple in Russian. Conditional subordinate clauses are also later, emerging at about 2;8. In both cases, it seems to be the semantic, and not the grammatical aspects which is difficult for the child.

(4) Noun endings indicating abstract categories of quality and action continue to be added until as late as seven. The only derivational noun suffixes learned before three are those of clearly concrete or emotive reference--diminutive and augmentative, endearing and pejorative. (Note that learning of derivational forms continues for much longer than learning of inflectional forms.)

(5) Finally, grammatical gender is responsible for what is perhaps the most difficult and drawn-out linguistic learning of the Russian speaking child, although it is almost always unequivocally marked phonetically. This is a category almost entirely lacking in semantic correlates, and apparently such correlates are an important aid in learning form-class distinctions. As discussed below, at first the child uses the feminine past tense ending for verbs predicated of all nouns, regardless of their gender markings--even if he knows they are semantically masculine (e.g., papa). Later the child uses the masculine past tense with many nouns which are semantically feminine. The gender component of the verb inflection is simply not treated as having semantic content. Likewise, as discussed below, the child first uses one stereotyped case ending for all nouns in that case, regardless of their gender (even if he can correctly identify gender-class membership on the basis of pronoun substitution and adjective agreement).[10]

The semantic and conceptual aspects of grammatical classes thus clearly play an important role in determining the order of their development and subdivision.

Formal complexity is another important variable determining rate and order of acquisition of grammatical devices. (This variable is frequently confounded with frequency of usage, as in the case of the passive.) Differing formal complexity of the expression of similar functions makes cross-linguistic comparisons difficult. Kenyeres (1927), for example, points out that while the accusative was late to develop in the Sterns' German-speaking children, it was extremely early in his Hungarian-speaking daughter. He attributes this difference to the fact that the accusative in Hungarian is simply expressed by affixing t to the noun. Another example of the retarding effect of formal complexity comes from the experiment of Zakharova (1958), discussed below. She found that declension of masculine and feminine nouns ending in palatalized consonants was not mastered until six or seven. This is a particularly difficult distinction, since the gender of each such noun must be rote memorized, in addition to the fact that the declensional patterns deviate from the standard in some respects.

Another factor affecting the rate of morphological development is the child's tendency to generalize. Overregularizations are discussed in detail in the next section. The late subcategorizations of form-classes similarly reflect the child's attempts to apply a single principle to all words in a system. Gvozdev's data and Solov'yeva's listing of typical grammatical errors of preschoolers (1960:24, 99-101) gives a number of examples of such later subdivisions of initially gross categories:

(1) At first all nouns are pluralized; later the noun class is divided into mass and count nouns which behave differently in regard to pluralization. At first it seems that the child feels that every noun

must have both forms--singular and plural. Thus he pluralizes mass nouns (bumagi 'papers'), counts mass nouns (odna sakhara 'one sugar'), and invents singulars for plural nouns which have no singular forms in Russian (e.g. lyut 'peop' as the singular of lyudi 'people').

(2) Animate and inanimate nouns have different accusatives forms in Russian. Subdivision of the noun class into these two categories, in regard to the accusative, is quite late in Russian children.

(3) A general modifier class is successively subdivided into classes of possessive pronouns, adjectives, and so on (analogous to the successive subcategorizations described by Brown and Bellugi [1964]).

(4) At first only the feminine past tense of verbs is used; then only the masculine; following a period of mixed usage, all three genders emerge as separate entities in verb past tense marking.

(5) Copular predicates in Russian are expressed by the instrumental case but Russian children use a nominative copular predicate universally, not subdividing the predicate until age six or later.

In most of these cases it is of interest to note once again that full mastery of the morphological system comes relatively late in Russian-speaking children. The distinction between mass and count nouns is not stabilized until age eight; the distinction between animate and inanimate nouns in the accusative is mastered only at four; gender agreement between nouns and verbs in the past comes at three, although agreement of number and person come a year earlier; and the subdivision of the copular predicate is not mastered until about age six.

Overregularizations of inflections

Overregularizations and overgeneralizations are universally notes as a salient feature of child speech in all languages. They form one of the major bodies of evidence that child speech is productive and systematic. Overregularizations are rampant in the child's learning of Russian morphology--small wonder, what with the great variety of inflectional categories, and with the additional great variety of forms within each category, determined on the bases of both phonological and grammatical realtions. For example, not only must the child learn an instrumental case ending for masculine, feminine, and neuter nouns and adjectives in singular and plural, but within each of these sub-categories there are several different phonologically conditioned suffixes (not to mention zero-endings, morphologically conditioned suffixes, and other complications). The child's solution is to seize upon one suffix at first and use it for every instance of that particular grammatical category. Various examples of this phenomenon are discussed below.

"Inflectional imperialism". Gvozdev's son at first used the suffix -om for all singular noun instrumental endings, although this suffix is used only for masculine and neuter singular nouns in the standard language. This suffix, however, has only one other function--a masculine and neuter prepositional case ending for adjectives. The corresponding dominant feminine singular noun instrumental ending (-oy), on the other hand, serves a variety of functions, being an adjectival suffix for four cases in the feminine and one in the masculine. Thus, to begin with (though feminine nouns are more frequent in Russian child speech), Zhenya used the suffix of fewer meanings--the masculine and neuter -om--for all instances of the instrumental case. This clarifies Gvozdev's assertion that grammatical categories are acquired earlier than morphological details. The child already possesses the category of instrumental case--and marks it accordingly--but it will take several years, perhaps, before he learns to correctly mark every instance of the instrumental in accordance with gender and with morphophonemic principles.

Gvozdev points out (1961:26) that the very same overgeneralization occurred in the speech of Adik Pavlov, as described in A. D. Pavlova's diary (1924).

An experiment carried out by Zakharova (1958) also presents the same picture. Her subjects--200 children between the ages of three and seven--were shown objects named in the nominative and were asked questions whose answers required placing the name (both familiar and unfamiliar names) in another case form. She found that the youngest children did not attend to the gender of the noun, revealed by the nominative form, but used stereotyped case endings for each case in their repertorie, regardless of gender. Like Zhenya, they used the suffix -om as a universal instrumental.

As gender comes to be more important in classifying nouns, other endings for each case enter. They do not, however, peacefully coexist with the already established endings. When a child learns, for example, that -oy--the feminine noun singular instrumental ending--can also serve as a noun instrumental ending, he abandons the masculine and neuter instrumental -om, which he has been using as a universal instrumental suffix, and for a while uses -oy as a universal instrumental. The same sequence occurs in Zhenya's speech development. The dominant instrumental suffix from 2;1 to 2;4 was -om, replaced by -oy as dominant from 2;5 to 3;0. Only later does -om re-enter to assume its place in standard Russian. Practice clearly does not insure the survival of a form in child speech--regardless of whether or not that form corresponds to adult usage (and presumably, regardless of whether or not its usage by the child is "reinforced" by adults).

This sequence is very similar to the development of the past tense in English. It is well-known that children regularize the past tense of irregular (strong) verbs--'comed', 'breaked', 'goed', doed' and so on. This tendency to regularize continues well into elementary school for some children. From a traditional psychological point of view one would expect to find that children begin by using some regular (weak) forms correctly--like 'walked', 'helped', and so on--and that they then over-extended this rule to the strong verbs. The real story, however, is much more interesting. In all of the cases which have been carefully studied the first past tenses are the correct forms of irregular verbs--'came', 'broke', 'went', and so on. Apparently these irregular verbs in the past tense--which are the more frequent past tense forms in adult speech--are learned as separate vocabulary items at a very early age. Subsequently, as soon as the child learns only one or two regular past tense forms, he replaced the correct irregular past tense forms with their incorrect overgeneralizations from the regular forms. Thus children actually say 'it came off', 'it broke', and 'he did it' *before* they say 'it comed off', 'it breaked', and 'he does it'. The crucial point here is that the irregular verbs, though they are frequent, are each unique--they do not follow a pattern, and evidently *it is patterns that children are sensitive to*.

The phenomenon of one form driving out another is also visible in other Russian domains. Popova (1958), for example, investigated gender agreement between nouns and verbs in the past tense in a cross-sectional study of 55 children ranging in age from 1;10 to 3;6. Her study is presented in detail below, as it presents a good example of Soviet experimental-pedagogical research techniques.

A sample pedagogical experiment--The experimental materials were stories in the present tense, containing masculine and feminine nouns, followed by questions about the stories in the past tense plural form, which does not distinquish as to gender. (It can be seen that the structure of Russian is well-suited to the design of psycholinguistic experiments!). For example, in response to the question, *Kakiye zver'i ubezhali v les?* ("Which animals ran away to the forest?"), the children would be required to answer in the singular, marking the verb for gender:

Volk ubezhal ("The wolf [masculine] ran away"), Lisa ubezhala ("the fox [feminine] ran away"), and so on.

Individual experiments were preceded, a day before, by a group session in which the experimenter began with questions such as the above, then read the story and then answered the questions in the required subject-predicate form. An important aspect of Soviet developmental research thus involves training little children to be subjects. Individual experiments were conducted on the following day, and 8,914 responses were analyzed. Children were classified into four groups on the basis of their responses:

(1) 22 children, aged 1;10-3;2 (7 boys, 15 girls): feminine verb ending predominated (0-34 per cent correct agreements with masculine nouns, 70-100 per cent with feminine nouns).

(2) 9 children, aged 2;6-3;3 (4 boys, 5 girls): masculine verbs ending predominated (75-100 per cent correct agreements with masculine nouns, 0-40 per cent with feminine nouns).

(3) 11 children, aged 2;2-3;5 (4 boys, 7 girls): both genders used and equally confused (45-81 per cent correct agreements with masculine nouns, 40-90 per cent with feminine).

(4) 13 children, aged 2;3-3;6 (8 boys, 5 girls): generally correct use of both genders (75-100 per cent correct agreements with both masculine and feminine nouns).

As is typical in the analysis of such data, the children are divided into age groups and allotted to the four performance categories, as shown in Table 3. The figures show that the younger children tended to overgeneralize the feminine verb ending, often using it as the past tense form for actions predicated of nouns of both genders. In older children, the masculine zero ending predominated as a verb ending. At all ages there were some children who used both forms, but while confused usage increased somewhat with age, there was no increase in correct usage over the whole age range.

Table 3

Distribution of Subjects into Gender-Agreement Groups on the Basis of Age (after Popova, 1958).

Age	N	Percentage of Ss in each Gender-Agreement Group			
		1 Feminine	2 Masculine	3 Mixed	4 Correct
1;10-2;6	25	52	8	16	24
2;7-3;0	18	39	17	22	22
3;1-3;6	12	17	33	25	25

Although this study samples a number of ages synchronically, it suggests a possible ontogenetic series. It may be that when the masculine (zero) ending of the past emerges in the speech of some children it tends to drive out entirely the earlier feminine (-a) ending, which re-enters only later in a period of mixed usage.

Popova's experiment did not conclude here, however, but, in the tradition of Soviet pedagogical experiments described above, continued with an attempt to train the children in correct gender agreement. Her findings demonstrate that such experiments can be quite revealing.

Training was carried on four times per week for two months, and, when effective, remained effective for at least two weeks, when a post-test was conducted. Training was most helpful for the children in the third group (mixed usage). Self-correction also appeared in this stage. Children in the first group (predominance of feminine verb endings) were least helped by training. This is taken as additional evidence for a sequence of stages.

The most successful training situation was one in which model animals were hidden in a little tower and the child was asked: "Who went [plural] into the tower?" If his answer was grammatically correct, the tower doors would open and the appropriate animal would be released. If his answer was incorrect, the doors would not open, and the experimenter would point out his error. If he then corrected himself, the animal would be released; if not, the experimenter would give him special training, and then the game would start over again. This training was highly successful, and occasionally would enable children to skip stages, moving from 1 (feminine) to 3 (mixed), or from 2 (masculine) to 4 (correct); or to move rapidly through the stages. Special training in this task was especially helpful--e.g., using only masculine nouns for children in the first stage (feminine). (As soon as both forms were present in the child's speech, rapid progress could be made using this technique.)

Determinants of "inflectional imperialism"--Why should a given inflectional form be singled out to predominate over all other at a given stage? The early predominance of the masculine and neuter instrumental -om was explained above on the basis of the confusing multiplicity of functions of its feminine competitor -oy, although the latter occurs with much greater frequency. Frequency also fails to predict the choice of the first predominating singular noun accusative. According to Gvozdev (1961:27), the most frequent adult form is the zero ending--that is, nouns ending in a variety of consonants in the accusative. Its competitors are the vowels -u, -a, and -o, among which -u is probably most frequent in accusative position. It is -u which enters child speech as the first accusative--for Zhenya Gvozdev and Adik Pavlov, as well as for the majority of the 200 children studied by Zakharova. Again, a single inflection is used to indicate a given case, regardless of gender. This example suggests that children prefer marked to unmarked forms. As Gvozdev points out: "Apparently the supplanting of the negative [i.e. zone] form under these conditions is to be explained by the fact that it is less clear and a less typical expression of case-meaning in comparison with suffixes" (1961:27). The same picture appears in regard to plural noun genitive: children choose the marked form -ov over the zero ending.

It is interesting to note that "imperialistic" inflections are not all chosen from a given paradigm. The predominating instrumental -om is masculine and neuter in the standard language, while the dominating ascusative -u is feminine, and so on. By and large, the associations of inflectional suffixes with given words are clearly not rote learned.

While frequency of occurrence does not seem to determine the selection of a suffix to serve as universal expression of a given case, it does seem to determine the order of emergence of subvariants within given gender-case categories, once cases are finally differentiated on the basis of gender. For all of the following examples, the order of emergence of noun suffixes in Zhenya's speech development matches their frequency of occurrence.

sing. instru. fem. : -oy before -'yu
sing. masc. prep. : -e before -u
sing. prep. : -e before -ĭ
pl. nom. : -y, -i before -a before -iya, -ii
pl. nom. : -ov before -ey

Inflectional productivity--Overregularizations provide one example of inflectional productivity. Another example comes from childish neologisms, which, as pointed out above, so delight the Russians. The Russian child (as well as the German child) has a far richer potentiality for word-formation than the English-speaking child and he apparently uses it well. Gvozdev says:

> ...the child makes wide use of the means of word-formation provided by his native language. He makes an especially vast use of suffixes--and this use is distinguished by exceptional precision and consistency of both meaning and sound (1949;2;102).

Indeed, the noted Soviet writer and translator, Korney Chukovskiy, has entertained Russians since 1925 with his fascinating collection of child language anecdotes and accompanying perceptive analyses. His book, From two to five (1961), has appeared in 15 Russian editions, and, in 1963, in English translation. Chukovskiy has been struck by the fact that children's invented words are always appropriate to the language, and can even be found to exist in other dialects or to have existed in earlier forms of Russian:

> ...the young child at times spontaneously arrives at word structures that were developed by the people over the centuries. His mind masters, as if miraculously, the same methods, processes, and pecularities of word construction which were used by his distant ancestors in building the language.
>
> Even the original words invented by children, which do not already exist in the language, seem almost real. They could have come into being, and their absence from the language seems to be merely fortuitour. One somehow reacts to such words as to old acquaintances, feeling that one has already heard them somewhere at some time (1963:5).

Soviet parents have been sending Chukovskiy child speech anecdotes for years, and he finds that some words have been repeatedly and independently invented by children--as if definite gaps existed in the language, waiting to be filled in. He reports an informal experiment (1963:5) in which he tried out one of these words, invented by another child, on his young daughter. "Not only did she understand at once the meaning of the word, but she did not even suspect that it did not exist, for it seemed to her completely normal" (ibid). In like fashion, many parents have written Chukovskiy that their children have understood words invented by other children, as reported in his book.

What Chukovskiy and his correspondents have done informally, Bogoyavlenskiy (1957), like Jean Berko (1958) in America, has done in a systematic experiment. His work again reveals the ability of Russian children to understand and produce various morphological features, while also showing that conscious metalinguistic attention is extremely difficult to achieve at early ages. Children of five and six were tested for their understanding of various noun suffixes (augmentative, diminutive, and agentive). The suffixes were appended to words not familiar to the children (an animal called a lar, a sweet kvas drink called lafit, and a fabric kashemir). The words were used to name pictured referents. The children were then asked to explain the meanings of these words with suffixes attached. If they found this task difficult, the words were then embedded in stories, using the various suffixes. All of the children could correctly identify the relative sizes of the referents on the basis of the augmentative and diminutive suffixes, but the agentive suffix was more difficult for them to interpret. Bogoyavlenskiy points out that the former do not change the "basic lexical meaning" of a word, while the latter (agentive) does change this meaning, and he speculates that morphological principles of "word change" (e.g. diminutive) are achieved at an earlier age than those of "word formation" (e.g., agentive).

When a child's performance was correct in this experiment, he still could not be brought to explain the formal differences between the words. For example, the experimenter would ask: "You were right about the difference between the animals--one is little and the other is big; now pay attention to the words themselves as I say them: lar--larenok; what's the difference between them?" It was found that: "Regardless of the repeated oral presentation of these words, not one of the children (who had no difficulty in determining the semantic differences between these words) could give any sort of answer in this case. The children gave confused and embarrassed smiles, or simply remained silent, making no attempt to analyze the sounds of the words" (Bogoyavlenskiy, 1957:263).

In another experiment, Bogoyavlenskiy asked children to supply diminutive suffixes to words which do not generally receive such suffixes, or at least not in the experience of the child (e.g. giraffe, acorn, oak, lion, ostrich, wolf, nail). All of the children successfully provided diminutive, and only diminutive suffixes, of many sorts. Their productions were generally correct, though all of them do not occur in the Russian language (since at least eight different suffixes were used by the children with these nouns). The only clearly incorrect usage, from the standpoint of standard adult Russian, was the application to inanimate objects of suffixes which in the adult language are used only to diminish animate objects. The children were generally correct in choosing suffixes following phonological rules of agreement with the final sound of the root word.

Comprehension

The importance of correlative studies of comprehension and production has been stressed above. The diary studies provide almost no information on comprehension, and what little appears is generally of small value. Consider, for example, the following excerpt from Lindner's diary:

> The subtlety of the child's understanding of situations and of language is demonstrated for me by the fact that he follows the order "Give me a kiss!" if one simply says: "Give me!" or "A kiss!" or "You haven't given me anything today" or "I thought you'd give me a kiss" (1898:37).

Of course, what is required here to test Lindner's assertion about speech comprehension are tests of the child's comprehension of non-sentences with the same words (e.g. 'Kiss me give', 'You haven't taken me anything today', etc.), and the administration of various sentences and non-sentences in a variety of controlled situations. No parents have taken the trouble to perform adequate, controlled comprehension tests. And, with the exception of a few recent experiments performed in the United States (e.g., Fraser, Bellugi, and Brown, 1963; Gleitman, 1965), careful study of speech comprehension has simply not been carried out in the West.

A number of Soviet studies deal with this problem, but most of them are concerned with comprehension of names and simple verbal instructions in early childhood (e.g. Luria, 1957, 1961), rather than with comprehension of more complex grammatical constructions.

Soviet experience in using very young children as subjects in experiments, however, provides useful suggestions about methods for dealing with such difficult subjects. As pointed out above in regard to Popova's experiment, Soviet researchers have learned that little children must first be trained to be subjects. Shvachkin, for example, offers the following methodological advice for dealing with children between the ages of one and two-and-a-half:

> In order to regulate the experimental trials and at the same time to secure an attentive relationship on the part of the children to the experimental task, we decided first of all to establish certain rules of behavior for the children during the experiment. The children were taught to put the experimental room in order, to arrange the furniture required for the experiment (little table and chairs), and were then transferred to an adjacent room to wait to be called. Upon entering the experimental room the children went to the table with toys and sat down in their chairs. At this point the children already knew that as soon as the experimenter seated himself across from them and took pen in hand they were required to give their names: "Vitya Kuz'min." "Vova Sergeyev." And so on.
>
> The experiment began immediately thereafter, usually lasting 10-15 minutes (1954:115)

Anyone who has worked with very young children cannot help but be amazed by the orderly experimental results reported by many Soviet investigators. The above insight into careful pre-experimental training procedures provides part of the explanation. Mallitzkaya (1960) succeeded in working with children as young as nine months, after spending several weeks training them to sit calmly and attend to the experiment, followed by additional training to perform as required by the experiment.

Soviet children, however, are not well-trained automats. Luria (1959, 1961) describes many studies of early speech comprehension stressing the peculiarities of attention and orientation in little children, together with the great importance of the nature of the ongoing situation and its possible distractions. For example a child younger than two, when asked to give the experimenter one of a number of objects lying on a table will not necessarily give the one requested, even if he knows its name. As soon as the experimenter starts to say "Give me..." the child already reaches out and hands him the nearest or brightest thing that strikes his eye. The word stimulates him to act--it can direct his gaze and grasp--but then other stimuli take over. Similarly, in a longitudinal study of children from the ages of 1;2 to 2;6, Lyamina (1960) concludes that looking at, pointing to, and manipulating a named object are three separable components of responding to names at this age. For example, in response to an instruction such as, 'Give me the drum', the child may look at the correct object, and even point to it and then give the experimenter a different object.

These results seem to indicate that once a child begins to respond, instructions cannot alter his behavior very much, if at all. The same sort of conclusion is suggested by other studies from Luria's laboratory. For example, if a child of this age is given a peg and a collection of rings, one can easily get him to put a ring on the peg with a verbal command. However, if this command is repeated several times, the child gets going "under his own steam" and it is impossible to get him to stop by telling him to stop putting rings on the peg, or to start taking them off: instructions to stop just increase his activity. The same phenomenon is revealed in other experiments, in which the child is given a rubber bulb to hold and instructed to squeeze it whenever a light goes on. Once the child begins to squeeze, he ignored the light, and it is extremely difficult to get him to terminate this behavior and respond only to the light. Again, the instruction 'Don't squeeze', given when the light is off, simply stimulates the child to squeeze all the harder. These findings led to a large body of research in the late fifties on the "directive function of speech," described in a number of placed (Luria, 1956-58, 1959, 1961; Slobin, 1966b). They provide clear methodological cautions to studies of comprehension in very young children.

A particularly successful and informative study of this type was a cross-sectional experiment on the comprehension of locative prepositions carried out by Sokhin (1959) on 43 children between the ages of 1;11 and 3;5. Children were instructed to place objects (blocks and rings) 'on' or 'under' one another. The technique is constructed to test comprehension of the preposition alone, with no guiding situational supports: the child is presented with only two objects at a time, and no pre-established "normal" spatial relationship holds between them. These important controls are almost always lacking in anecdotal reports of children's linguistic comprehension. The fact, for example, that a child in the home correctly performs commands like 'Put the glass on the table' and 'Put the stool under the sink' in no way demonstrates his comprehension of 'on' versus 'under.' He may also have performed appropriately if the prepositions had been interchanged in the two commands, substituted for other prepositions, or omitted. The habitual placement of these objects may be a sufficient cue to his comprehension. Sokhin avoids these problems in his carefully designed experiment.

He found that the comprehension of some prepositions by two-year-olds is very much tied to action; for example, while a child could correctly perform the action of 'put the block under the table,' he could not 'put the block under the ring,' when the ring was lying on the table. Sokhin argues that 'under,' in the second case, requires two actions--lifting up the ring and placing the block under it--whereas 'under' in the first case requires only one. This notion is supported by the fact that some children held the block under the table, beneath the point where the ring was lying, rather than pick up the ring and place the block under it on the surface of the table. Thus, Sokhin points out, the meaning of a word changes with age. In this case, for example, although two-year-olds have a general idea of the spatial relations denoted by the preposition 'under,' they have yet to separate this notion from specific actions--it is not yet a general concept of spatial relations, though the children seem to understand it correctly when dealing with a variety of everyday situations. Perceptual variables also influence children's comprehension of prepositions. For example, children at a certain age prefer to place a smaller object on top of a larger object, regardless of the experimenter's instruction.

Experiments such as Sokhin's indicate the complex interaction of variables--linguistic and non-linguistic--involved in the child's developing comprehension of speech. Much more work of this kind is needed.

Many aspects of linguistic ontogenesis have not been discussed in this paper. For each question which has been raised it is clear that we lack sufficient data to formulate a satisfactory answer. It is hoped, however, that the reader has been convinced of the value of cross-linguistic comparisons in attempting to solve the problem of how the human child goes about learning to speak. The diaries listed in Table 1 are all available somewhere; no doubt careful analysis of many of them will provide valuable data and suggest new hypotheses. In addition, much can be learned from the Soviet approach to developmental psycholinguistics--namely, painstaking, longitudinal and cross-sectional, experimental and pedagogical investigation of very early stages of language development, using large numbers of children. Research of this sort is also expanding in the United States (see references in Ervin-Tripp and Slobin, 1966:436-439; Ervin-Tripp, in press). One can only hope that such studies will continue--not only in the USA and USSR, but in other countries as well.

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Note: The following conventions are observed in transliterating from Russian:

И - i
Й - y
Ы - y
Ю - yu
Я - ya
Ъ - "
Ь - "
е - ye initially, after vowels and; elsewhere e
э - e

Ж - zh
Х - kh
Ц - tz
ч - ch
ш - sh
щ - shch

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Footnotes

1. The only reliability check on written records (at least in the literature covered here) is mentioned by Braine (1963a). He instructued parents "not to attempt to represent pronunication, but merely to record in conventional spelling the word or sequence of words they heard the child say" (p. 2). In a footnote he reports: "Comparison of the written record with tape recordings made at the same age [viz., stage of two-word utterances] revealed that constructions present in the one were always present in the other, and with about equal frequency, a fact which is evidence of the reliability of the written records"(p. 2).

2. "It is difficult and perhaps arbitrary in many languages to draw the line between morphology and syntax, but it is extremely convenient to make such a distinction for Garo, since there are stretches of several syllables set off by characteristic junctures which can be called words, and the grammatical devices used to form these words are very different from those used to join words together. If the distinction is made, Stephen defied the generalization that syntax comes first by learning to make both types of constructions simultaneously. Some reasons for this are obvious: What I am calling morphology in Garo is much more essential than the morphological processes of English, or even of the other European languages.... Moreover, it is far more regular, and therefore no doubt easier to learn than the morphology of European languages. What I am calling Garo morphology, then, has somewhat the character of syntax in the European language...." (Burling, 1959:65-66).

3. In longer sentences, of course, not all orderings are possible, but ordering is till much freer than in English. The following discussion applies only to simply sentences containing subject, verb, and object.

4. An interesting confirmation of the notion that inflection is assigned to wrods on the basis of their ordinal positions in sentences comes from Imedadze's study of her Georgian-Russian bilingual daughter. In subject-verb-object sentences expressing desire (e.g. 'Dali wants a dress' where Dali is the girl's name), the object is inflected in Russian while the subject remains uninflected in the nominative base-form; the matter is precisely the opposite in Georgian, where the object is uninflected and the subject receives a dative ergative case-ending. This child learned the Russian form first, and generalized the pattern of object inflection to Georgian (e.g. she said *Dali unda kabas* 'Dali wants a dress', instead of the correct *Kalis unda kaba*). She was thus applying a Georgian case-ending in a Georgian sentence in analogy to the position of a Russian

inflection in Russian sentences. Contrary to Braine's suggestion, she has not learned that the subject and object of a sentence are the words preceding given suffixes (including, in this sample, "zero" suffixes), but had learned that a word in a given sentence position receives a case-ending. The analogy from Russian to Georgian clearly indicates the productivity of this rule.

5. It seems that one can choose between a "tree"model (two-dimensional) and a "mobile" model (three-dimensional) in visualizing underlying strings. Perhaps all that is necessary in identifying the subject, verb, and object of a sentence is the relation of terminal points to nodes, following Chomsky's definitions (1965:71): "Subject of: [NP, S]; Predicate-of [VP, S]; Direct-Object-of: [NP, VP]; Main-Verb-of: [V, VP]." These relations can be determined regardless of the order of elements in the base string, as long as they are hierarchically organized. Perhaps some children begin only with a notion of the basic grammatical relations, ignoring order. Braine describes one child for whom order in two-word sentences was apparently quite free (though one would need more examples to support this claim), and concludes: "Apparently the agent-action sequence is not necessarily primitive in the English sentence but can develop, at least in some children, as a polarization of a sequence which is initially more or less random" (1963b:338). In the absence of comprehension tests, however (see below), one cannot fully ascertain whether the semantic implications of word order are part of a child's competence at a given stage.

6. The following stimuli are reported in El'kin's article: vklychayu tok/tok vklyuchayu ('I'm switching on the current'); rukopis' prochitana/proitana rukopis' ('The manuscript has been read'); student vyderzhal ekzamen/vyderzhal student ekzamen/ ekzamen vyderzhal student/student ekzamen vyderzhal ('The student passed the examination').

7. In order to make the discussion intelligible to the non-Russian speaker, a few words about the grammatical structure of the language are in order. Russian has three genders and six cases; nouns, adjectives, and pronouns show gender, case and number. Verbs are conjugated for person and number, and, in the past tense, also for gender of subject noun in the singular. Verbs are marked for tense (three tenses and aspect [perfective-imperfective, and for verbs of motion, also determinate-indeterminate]). There are many participial forms. The morphology is highly productive, and freely-used suffixes of many sorts abound (e.g. diminutive, augmentative, endearing, pejorative, agentive, and so on). As pointed out,above, word order is much freer than in English.

8. The plural is also reported as the first noun inflection in English (Bellugi, this volume; Velten, 1943) and German (Stern and Stern, 1907).

9. A similar findings is reported by Miller and Ervin for an English-speaking boy: "The word *have* in English serves as a verb, but it does not have a meaning of action. Harlan had considerably difficulty in giving *have* the verb markers he used with other verbs. It might be objected that the difficulty stems from its use as an auxiliary, but this is a specialized use that had not yet (at 3.1) appeared in Harlan's speech. Further, *do*, which was used by Harlan both as an auxiliary and main verb, was marked appropriately when have was not. Thus we have examples of past tense markers for many verbs, including *do*, at least six months before the past tense was marked for have, although contexts in which the past tense would have been appropriate for this verb did occur before that time"(1964:24).

10. As for other languages, Kaczmarek (1953) reports gender to pose similar problems for the Polish child. German gender presents quite a different problem than Russian and Polish gender. The German child must learn to mark each noun for gender in terms of a proceding articel--*der*, *die*, or *das*, while the Russian child receives his gender markings "ready-made" in the phonological shape of the noun ending--masculine zero, feminine -*a*, and neuter -*o* (with additional phonological forms in less frequently occurring word classes). The German child, however, does not have to learn noun-verb agreement in gender, and has faw fewer gender-related suffixes (noun, adjective, and article) to learn than the Russian child. The data on German gender acquisition have not been carefully reviewed for this paper. The Sterns' Gunther was still using a universal, genderless article *ĕ* at 2;4, and further details of his gender development are not presented. Their older child, Hilde, used a few definite articles at 2;6, but generally used masculine and feminine nominative singular correctly (neuter is not mentioned). This is a fairly simple task of association, in comparison with the formal difficulties presented by the various uses of Russian gender. She was still using a universal, genderless indefinite article *ne*, *n*, or *ĕ*.